[0105] It will be appreciated that any "computer" described herein can comprise a collection of one or more individual processors/processing elements that may or may not be located on the same circuit board, or the same region/position of a circuit board or even the same device. In some embodiments one or more of any mentioned processors may be distributed over a plurality of devices. The same or different processor/processing elements may perform one or more functions described herein.

[0106] It will be appreciated that the term "signalling" may refer to one or more signals transmitted as a series of transmitted and/or received signals. The series of signals may comprise one, two, three, four or even more individual signal components or distinct signals to make up said signalling. Some or all of these individual signals may be transmitted/received simultaneously, in sequence, and/or such that they temporally overlap one another.

[0107] With reference to any discussion of any mentioned computer and/or processor and memory (e.g. including ROM, CD-ROM etc), these may comprise a computer processor, Application Specific Integrated Circuit (ASIC), field-programmable gate array (FPGA), and/or other hardware components that have been programmed in such a way to carry out the inventive function.

[0108] The applicant hereby discloses in isolation each individual feature described herein and any combination of two or more such features, to the extent that such features or combinations are capable of being carried out based on the present specification as a whole, in the light of the common general knowledge of a person skilled in the art, irrespective of whether such features or combinations of features solve any problems disclosed herein, and without limitation to the scope of the claims. The applicant indicates that the disclosed aspects/embodiments may consist of any such individual feature or combination of features. In view of the foregoing description it will be evident to a person skilled in the art that various modifications may be made within the scope of the disclosure.

[0109] While there have been shown and described and pointed out fundamental novel features as applied to different embodiments thereof, it will be understood that various omissions and substitutions and changes in the form and details of the devices and methods described may be made by those skilled in the art without departing from the spirit of the invention. For example, it is expressly intended that all combinations of those elements and/or method steps which perform substantially the same function in substantially the same way to achieve the same results are within the scope of the invention. Moreover, it should be recognized that structures and/or elements and/or method steps shown and/or described in connection with any disclosed form or embodiment may be incorporated in any other disclosed or described or suggested form or embodiment as a general matter of design choice. Furthermore, in the claims means-plus-function clauses are intended to cover the structures described herein as performing the recited function and not only structural equivalents, but also equivalent structures. Thus although a nail and a screw may not be structural equivalents in that a nail employs a cylindrical surface to secure wooden parts together, whereas a screw employs a helical surface, in the environment of fastening wooden parts, a nail and a screw may be equivalent structures.

1. An apparatus comprising first and second layers of electrically conductive material separated by a layer of electrically insulating material, wherein one or both layers of electrically conductive material comprise graphene, and wherein the apparatus is configured such that electrons are able to tunnel from the first layer of electrically conductive material through the layer of electrically insulating material to the second layer of electrically conductive material.

2. The apparatus of claim **1**, wherein the apparatus is configured such that electrons are unable to tunnel from the second layer of electrically conductive material through the layer of electrically insulating material to the first layer of electrically conductive material by virtue of providing a difference in voltage to the first and second layers of electrically conductive material, and/or providing a difference in work function between the first and second layers of electrically conductive material.

3. The apparatus of claim **1**, wherein one or both of the first and second layers of electrically conductive material are made solely from graphene.

4. The apparatus of claim **1**, wherein the first layer of electrically conductive material comprises graphene, and the second layer of electrically conductive material comprises one or more of Cr, Au, Al, Ni, Cu, Pt, W, and indium tin oxide or an alloy comprising one or more of the same.

5. The apparatus of claim **1**, wherein one or more of the first layer of electrically conductive material, the second layer of electrically conductive material and the layer of electrically insulating material are optically transparent.

6. The apparatus of claim **1**, wherein the apparatus is formed on a supporting substrate, and wherein the supporting substrate is electrically insulating and/or optically transparent.

7. The apparatus of claim **1**, wherein the layer of electrically insulating material comprises one or more of Al_2O_3, HfO_2, BN and diamond-like carbon.

8. The apparatus of claim **1**, wherein the second layer of electrically conductive material comprises one or more nanopillars.

9. The apparatus of claim **1**, wherein the apparatus comprises a passivation layer on top of the first or second layer of electrically conductive material.

10. The apparatus of claim **2**, wherein the apparatus comprises a voltage source configured to apply a potential difference between the layers of electrically conductive material to facilitate the tunnelling of electrons from the first layer of electrically conductive material through the layer of electrically insulating material to the second layer of electrically conductive material, and impede the tunnelling of electrons from the second layer of electrically conductive material through the layer of electrically insulating material to the first layer of electrically conductive material.

11. The apparatus of claim **10**, wherein the voltage source is configured to apply a negative potential to the first layer of electrically conductive material and/or a positive potential to the second layer of electrically conductive material.

12. The apparatus of claim **1**, wherein the electrons are hot electrons generated when the first layer of electrically conductive material is illuminated by electromagnetic radiation.

13. The apparatus of claim **1**, wherein the apparatus comprises an antenna configured to allow a flow of electrons when the antenna is illuminated by electromagnetic radiation, and wherein the apparatus is configured such that the electrons are able to tunnel from the first layer of electrically conductive material through the layer of electrically insulating material to the second layer of electrically conductive material.